

PTO/SB/20 (09-07)

Approved for use through 12/31/2008. OMB 0651-0050

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM BETWEEN THE (1) JPO OR (2) UKIPO, AND THE USPTO

Application No.:	10/529,186	First Named Inventor:	Nicolas Goujon
Filing Date:	Oct. 7, 2003	Attorney Docket No.:	14.0210-PCT-US
Title of the Invention:	MULTI-PART SEISMIC CABLE		

THIS REQUEST FOR PARTICIPATION IN THE PPH PILOT PROGRAM MUST BE FAXED TO:
THE OFFICE OF THE COMMISSIONER FOR PATENTS AT 571-273-0125 DIRECTED TO THE ATTENTION OF MAGDALEN GREENLIEF

APPLICANT HEREBY REQUESTS PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM AND PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE PPH PILOT PROGRAM.

The above-identified application validly claims priority under 35 U.S.C. 119(a) and 37 CFR 1.55 to one or more corresponding JPO application(s) or UKIPO application(s).

The ☐ JPO ☒ UKIPO application number(s) is/are: 0223842.8

The filing date of the ☐ JPO ☒ UKIPO application(s) is/are: 12 Oct. 2002

I. List of Required Documents:

- a. A copy of all JPO office actions (excluding "Decision to Grant a Patent") in the above-identified JPO application(s), or a copy of all UKIPO office actions in the above-identified UKIPO application(s).

☒ Is attached.

☐ Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these documents via the Dossier Access System.

*It is not necessary to submit a copy of the "Decision to Grant a Patent" and an English translation thereof.

- b. A copy of all claims which were determined to be patentable by the JPO in the above-identified JPO application(s), or a copy of all claims which were determined to be patentable by the UKIPO in the above-identified UKIPO application(s).

☒ Is attached.

☐ Is available via Dossier Access System. Applicant hereby requests that the USPTO obtain these documents via the Dossier Access System.

- c. English translations (where applicable) of the documents in a. and b. above along with a statement that the English translations are accurate are attached.

Information disclosure statement listing the documents cited in the JPO office actions or UKIPO office actions is attached.

Copies of all documents are attached except for U.S. patents or U.S. patent application publications.

[Page 1 of 2]

This collection of information is required by 35 U.S.C. 119, 37 CFR 1.55, and 37 CFR 1.102(d). The information is required to obtain or retain a benefit by the public, which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. FAX COMPLETED FORMS TO: Office of the Commissioner for Patents at 571-273-0125, Attention: Magdalen Greenlief.

PTO/SB/20 (09-07)

Approved for use through 12/31/2008. OMB 0851-0058

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1996, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

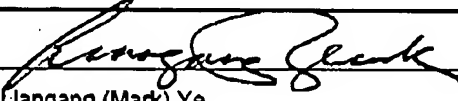
**REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM
BETWEEN THE (1) JPO OR (2) UKIPO, AND THE USPTO**
(continued)

Application No..	10/529,186	First Named Inventor:	Nicolas Goujon
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II. Claims Correspondence Table:

Claims in US Application	Patentable Claims in JP/UKIPO Application	Explanation regarding the correspondence
1-4, 13-19 20, 24, 29-34 as amended	1-4, 13-19 20-23, 24-28, 33-37 amended and granted	The claims in US application are identical to the same (or similarly) numbered claims in the UK granted patent as listed on the left.

III. All the claims in the US application sufficiently correspond to the patentable/allowable claims in the JPO or UKIPO application.**IV. Payment of Fees:**The Commissioner is hereby authorized to charge the petition fee under 37 CFR 1.17(h) as required by 37 CFR 1.102(d) to ☒ Deposit Account No. 50-1720.☐ Credit Card. Credit Card Payment Form (PTO-2038) is attached.

Signature		Date	9/26/2007
Name (Print/Typed)	Liangang (Mark) Ye	Registration Number	48,276

IN THE UNITED STATES PATENT AND TRADEMARK OFFICEIn re Application of: Nicolas Goujon *et al.*

Serial Number: 10/529,186

Confirmation Number: 4412

Int. Filing Date: October 7, 2003

Priority Date: October 12, 2002

Entitled: MULTI-PART SEISMIC CABLE

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Group Art Unit: 2856

Examiner: Unknown

Atty Dkt No.: 14.0210-PCT-US

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Index of documents

accompanied a request for participation in the Patent Prosecution Highway (PPH) Pilot Program between the UKIPO and the USPTO.

1. The request (2 pages)
2. **This index** (1 page)
3. Preliminary amendment (6 pages)
4. Search report from UK IPO, 25 February, 2003 (5 pages, including a cover)
5. Examination report from UK IPO, 10 October, 2005 (12 pages, including a cover)
6. Further examination report from UK IPO, 1 November, 2005 (4 pages, including a cover)
7. Report of telephone conversation, 13 January, 2006 (2 pages including a cover)
8. Notification of Grant, 14 February 2006, (3 pages including a cover)
9. UK patent, GB 2 414 299 B front page and certificate (2 pages)
10. Two IDS were submitted in this case, a first one on 3/24/2005 together with the national phase entrance; a second one on 1/10/2007. (copy not included)

[Redacted]

Remote User

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14.0210-GB, 20030211, SEARCH REPORT, 11
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**The Patent Office
Patents Directorate**

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E-mail: robert.mumford@patent.gov.uk
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Fax: 01633 814444
Minicom: 08459 222250
DX 722540/41 Cleppa Park 3
<http://www.patent.gov.uk>

Your Reference: AMS.P52316GB
Application No: GB 0223842.6

12 February 2003

Dear Sirs

Patents Act 1977: Search Report under Section 17(5)

I enclose two copies of my search report and a copy of the citations.

Publication

I estimate that, provided you have met all formal requirements, preparations for publication of your application will be completed soon after **2 March 2004**. You will then receive a letter informing you of completion and telling you the publication number and date of publication.

Amendment/withdrawal

If you wish to file amended claims for inclusion with the published application, or to withdraw the application to prevent publication, you must do so before the preparations for publication are completed. **No reminder will be issued.** If you write to the Office less than 3 weeks before the above completion date, please mark your letter prominently: **"URGENT - PUBLICATION IMMINENT"**.

Yours faithfully

Robert C. Mumford
Examiner

¹ Use of E-mail: Please note that e-mail should be used for correspondence only.



INVESTOR IN INDIA

Application No: GB 0223842.6
 Claims searched: All

Examiner: Robert C Mumford
 Date of search: 11 February 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1, 11 & 29.	SU 001718174 A (PROIZV OB NEFT'GEOFIZPRIBOR) see abstract and fig 2.
X	1, 2, 3, 13 & 29.	US 5265066 A (SVENNING) see whole doc esp fig 3.

Categories:

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art.
Y Document indicating lack of inventive step if combined with one or more other documents of same category.	P Document published on or after the declared priority date but before the filing date of this invention.
R Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the IJCV:

G1G

Worldwide search of patent documents classified in the following areas of the IPC:

G01V, H02G

The following online and other databases have been used in the preparation of this search report:

Online WPI, EPODOC, JAPIO

none none none

© EPCDOC / EPO

PN - SU1718174 A 19920307
PD - 1992-03-07
PR - SU19894727769 19890804
OPD - 1989-08-04
TI - SEISMIC CABLE FOR SHALLOW WATER
IN - USHKANOV VALENTIN N (SU) MIKHAJLENKO VIKTOR N (SU);
KRYUCHKOV ANATOLIJ I (SU) SUN SHUNI (SU)
PA - PROIZV OB NEFTEGEOFIZPRIBOR N (SU)
IC - G01V1/38

© WPI / DERWENT

TI - Marine seismic research cable for shallow waters - has automatic switch in form of reed relay fitted with upper and lower stops and permanent magnet having freedom to displace along axis of reed relay

PR - SU19894727769 19890804

PN - SU1718174 A1 19920307 DW199304 G01V1/38 005pp

PA - (NEFT-R) NEFTEGEOFIZPRIBOR SCI PRODN ASSOC

IC - G01V1/38

IN - KRYUCHKOV A I; MIKHAILENKO V N; USHKANOV V N

AB - SU1718174 The marine cable consists of identical sections, each of which includes a multicore cable (1) with couplers (2) for connecting adjacent sections. The couplers (2) are fitted with taps (3) connected to geophones gps (4) provided with fixture clamps (5) and side bearing rods (6). The clamps (5) fasten the geophones gps (4) to the cable (1), while the side rod (6) holds the geophone gp. in the required working position.

- USE/ADVANTAGE - For marine seismic prospecting in extremely shallow waters. Increased fidelity of seismic signals reception. Bul.9/7.3.92.

- (Dwg.1/4)

OPD - 1989-08-04

AN - 1993-035064 [04]

none none none



US005265066A

United States Patent [19][11] **Patent Number:** 5,265,066

Svenning et al.

[45] **Date of Patent:** Nov. 23, 1993[54] **SEISMIC CABLE**[75] **Inventors:** Bjornar Svenning, Trondheim; Elvind Berg, Rønneheim, both of Norway[73] **Assignee:** Den norske stats oljeselskap a.s., Stavanger, Norway[21] **Appl. No.:** 849,061[22] **PCT Filed:** Oct. 22, 1990[86] **PCT No.:** PCT/NO90/00157

§ 371 Date: Apr. 27, 1992

§ 102(e) Date: Apr. 27, 1992

[87] **PCT Pub. No.:** WO91/06877

PCT Pub. Date: May 16, 1991

[30] **Foreign Application Priority Data**

Oct 26, 1989 [NO] Norway 894261

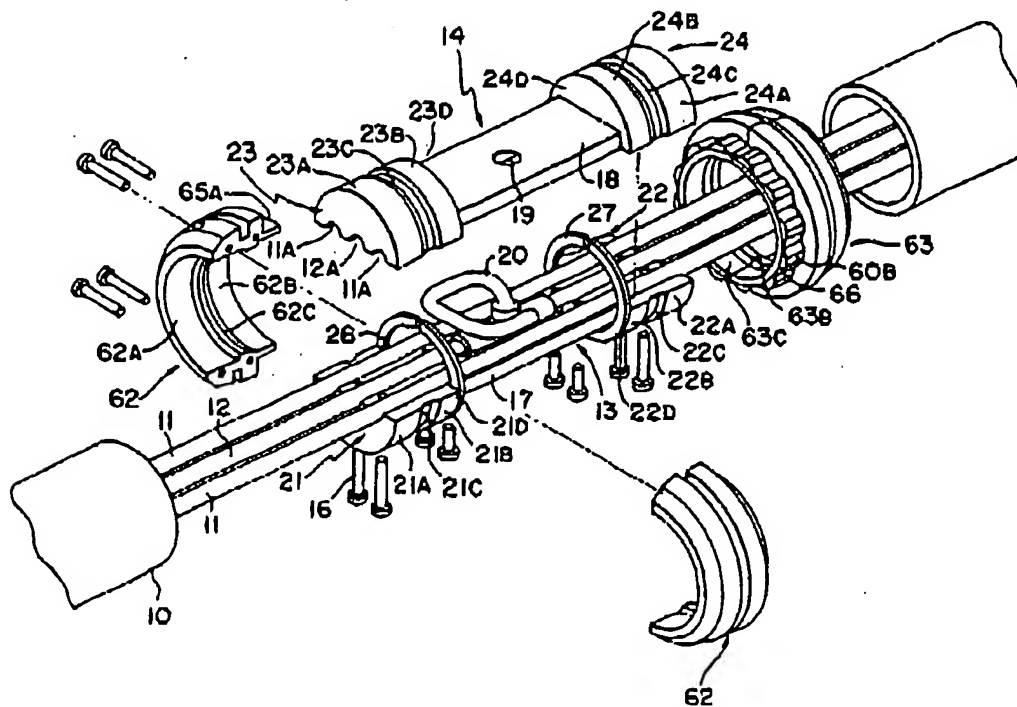
[51] **Int. Cl.:** G01V 1/38[52] **U.S. Cl.:** 367/20; 367/154[58] **Field of Search** 367/20, 153, 154, 15, 367/16; 174/101.5; 181/402; 439/284[56] **References Cited****U.S. PATENT DOCUMENTS**3,713,085 1/1973 Laurent et al. 340/7
3,939,464 2/1976 Svenson 367/20

3,987,404	10/1976	Woodruff	340/6 R
4,323,988	4/1982	Will et al	367/4
4,500,980	2/1985	Copeland	367/154
4,725,990	2/1988	Zihllich, Jr.	367/15
4,870,625	9/1989	Young	367/16
4,920,523	4/1990	Kruka et al.	367/188
4,953,136	8/1990	Kamata et al	367/25

FOREIGN PATENT DOCUMENTS1498958 1/1978 United Kingdom
21083221 1/1982 United Kingdom*Primary Examiner*—Ian J. Lobo*Attorney, Agent, or Firm*—Foley & Lardner[57] **ABSTRACT**

A marine seismic seabed cable for use on or near the seabed includes at least one pulling cable, a data cable, and a sleeve which surrounds the data cable and the pulling cable. Groups of geophones and position metering instruments are placed along the cable with the position metering instruments and geophones being disposed in a geophone sphere. The geophone sphere and the pulling cables are to a substantial degree mechanically isolated from each other so that, for example, shocks and signals against the seabed cable will only be transferred to a minor extent to the geophone sphere.

11 Claims, 8 Drawing Sheets



Remote User

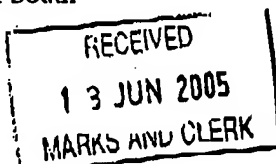
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**14.0210-GB, 20050610, FIRST EXAMINATION
10/18/07 04:43 PM**



INVESTOR IN PEOPLE

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Your Reference: AMS.P52316GB
Application No: GB0223842.6

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<http://www.patent.gov.uk>

10 June 2005

Dear Sirs

Patents Act 1977: Examination Report under Section 18(3)

Latest date for reply:

10 October 2005

I enclose two copies of my examination report and a copy of the new citations.

By the above date you should either file amendments to meet the objections in the enclosed report or make observations on them. If you do not, the application may be refused.

Yours faithfully

Stephen Jennings
Examiner

'Use of E-mail: Please note that e-mail should be used for correspondence only.'



Your ref :	AMS.P52316GB	Examiner :	Stephen Jennings
Application No:	GB0223842.6	Tel :	01633 814986
Applicant :	WesternGeco Seismic Holdings Limited	Date of report :	10 June 2005
Latest date for reply:	10 October 2005	Page 1/6	

Patents Act 1977

Examination Report under Section 18(3)

Novelty (Section 1(1)(a))

1. The invention as defined in claims 1,2,3,4,6,9,11,16,19,22,23,24,25,26,29,30,32 and 35 is not new because it has already been disclosed in each of the following documents:

US 2,923,916* (Woodworth) relevant to claims 1,6,9,11,16,24,29,32 and 35
US 3,372,368* (Dale) relevant to claims 1,6,9,11,29 and 32
US 4,398,276* (Kruppenbach) relevant to claims 1,11,24 and 29
US 4,884,249* (Snook) relevant to claims 1,11,19,22,23,29 and 32
US 5,265,066 (Svenning) relevant to claims 1,2,3,4,9,11,24,25,26,29,30,32 and 35

* I regret that these documents were not cited earlier, but you will be aware that they are listed on the search report on your equivalent PCT application.

2. Figures 2-5 of US 2,923,916 show a marine seismic cable having a number of seismic detectors disposed thereon. As described at column 2 lines 5-8, a the cable 11 includes strain element. I therefore consider the cable 11 to be a support cable. The seismic sensors 13,14 and 15 are interconnected by a second cable 20, which I consider to be a signal cable. It can clearly be seen from the figures that the signal cable 20 is attached to the support cable 11 at a plurality of points along its length. US 2,923,916 therefore demonstrates that the invention as defined in independent claims 1 and 29 is not new.

3. As mentioned at column 2 lines 5-8 of US 2,923,916, the cable 11 includes signal leads. Claim 6 therefore lacks novelty.

4. I consider it implicit that the signal cable 20 in US 2,923,916 would contain a plurality of leads, since there are several interconnected seismic detectors. Furthermore it is implicit that the cable 20 would be sheathed, to provide environmental protection. US 2,923,916 therefore shows that claim 9 is not new.

5. Figures 2 and 3 of US 2,923,916 clearly show that there are a plurality of sensor modules 13,14 and 15 electrically connected to the signal cable 20, illustrating lack of novelty in claim 11.



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Application No : GB0223842.6

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[Examination Report contd.]

6. It appears evident from figure 2 of US 2,923,916 that the points of attachment of the two cables are spaced in proportion to the length of the sensor modules. Claim 16 lacks novelty.

7. Claim 24 is also anticipated by US 2,923,916, as figure 2 shows that the support cable 11 and the signal cable 20 are physically connected together at the sensor modules 13,14,15. Similarly claim 35 lacks novelty.

8. As shown in figure 2 of US 2,923,916 the signal cable and the support cable are separated between the points of attachment. Claim 32 therefore lacks novelty.

9. US 3,372,368 describes a marine seismic cable which has a support cable (main tension cable) 21 and a signal cable comprised of streamer sections 29 through 31. A number of hydrophones 24,25,26 and 27 are disposed on the signal cable. This document shows a lack of novelty in independent claims 1 and 29.

10. In view of lines 2-4 in column 3 of US 3,372,368, and following the reasoning in paragraph 4 above, claims 6 and 9 can be seen to lack novelty.

11. Figure 1 of US 3,372,368 clearly illustrates a plurality of sensors modules 24,25,26 and 27 electrically connected to the signal cable 29 through 31. Claim 11 therefore lacks novelty.

12. As shown in figure 1 of US 3,372,368 the signal cable 29-31 and the support cable 21 are separated between the points of attachment. Claim 32 therefore lacks novelty.

13. Figure 2 of US 4,398,276 shows a seismic cable which has a signal cable 14 which interconnects a plurality of seismic detectors 12. Each detector is attached to a line 30. I consider the line 30 to be a support cable in the sense that it is utilised to pull the sensors out of the ground. The sensors illustrated at the right hand side of figure 2, and their interconnecting cable, are supported by the line 30. This document therefore shows that the invention, as defined in independent claims 1 and 29, is not new.

14. US 4,398,276 also clearly shows lack of novelty in dependent claims 11 and 24.

15. Figure 2 of US 4,884,249 shows a marine seismic streamer comprising a floating member 8 which supports, via ropes 10, an active member 9. Though not explicitly stated in the document, it is clear that active member 9 carries a number of seismic sensors,



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Application No : GB0223842.6

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[Examination Report contd.]

probably indicated at 13. I consider the floating member 8 to be a support cable and the active member 9 to be a signal cable. US 4,884,249 shows lack of novelty in independent claims 1 and 29.

16. US 4,884,249 also shows a lack of novelty in dependent claim 11.

17. Claim 19 lacks novelty in the light of US 4,884,249 as I consider the ropes 10 to be 'arms'. Since the limitation that the arms are rigid or semi-rigid is introduced in claim 20, I do not consider the term 'arms' in claim 19 to be so limited. Sleeves and rings or swivels 15 and 16 provide rotational connection to the signal cable.

18. Claims 22 and 23 also lack novelty in view of US 4,884,249. The sleeves 15 act as stops restraining movement of the rings 15 along the length of the cable. I consider the sleeve and ring arrangement to be a bearing, in the broad sense of the term.

19. US 4,884,249 also shows a lack of novelty in claim 32 since the signal cable 9 and the support cable 8 are separated between the points of attachment.

20. US 5,265,066 shows a seismic cable which comprises pulling cables 11 and a data cable 12, as shown in figure 3 and 5. Along the cable are provided cable spheres 6, as shown in figure 1A, each of which include geophones 51,52,53 and an inclination meter 55. I consider the pulling cables, data cable and cable spheres to correspond to the support cable signal cable and sensor modules respectively in your claims. Independent claims 1 and 29 lack novelty in view of US 5,265,066.

21. Figure 3 shows that the seismic cable of US 5,265,066 includes a protective sleeve 10 provided to enclose the pulling cables 11 and the data cable 12. This shows lack of novelty in claims 2 and 3.

22. Claim 4 lacks novelty over US 5,265,066 as two (i.e. a plurality of) pulling cables are provided.

23. It is implicit that the data cable 12 in US 5,265,066 includes a plurality of leads cabled by a sheath as there are clearly a number of sensors in each of the plurality of cable spheres. Claim 9 therefore lacks novelty.

24. Having regard to the above comments US 5,265,066 shows that claim 11 is not new.

25. Figures 3 and 5 of US 5,265,066 shows that claims 24-26 lack novelty. The sensors in each of the cable spheres 6 are connected to the data cable 12 by a connecting wire 20.



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[Examination Report contd.]

The data cable 12 and the pulling cables 11 are attached to each other by a two-piece clamp 13,14 which has grooves 11a,12a through which the cables run.

26. The cable spheres 6 of US 5,265,066 might be considered to be 'electronics modules' in that they contain electronic sensors. Accordingly the invention, as defined in claim 30, lacks novelty.

27. Claim 32 lacks novelty over US 5,265,066, as the pulling cables 11 and the data cable 12 are separated from each other between the points at which they are attached.

28. The data cable 12 and the pulling cables 11 are connected at a plurality of the cable spheres 6. In view of this, claim 35 lacks novelty.

Inventive step (Section 1(1)(b))

29. The invention as defined in claims 4,5,10 and 12 is obvious in view of what has already been disclosed in the following documents:

US 2,923,916* (Woodworth) relevant to claims 4,5,10 and 12
US 3,372,368* (Dale) relevant to claims 4,5,10 and 12
US 4,398,276* (Kruppenbach) relevant to claim 4 and 10,12
US 4,884,249* (Snook) relevant to claims 10 and 12

30. Though column 2 lines 5-8 of US 2,923,916 only mentions one strain element, the skilled man would recognise that a plurality of strengthening members could be provided in the support cable to provide the necessary strength for towing. Such a minor and routine modification would not involve any inventive ingenuity. Furthermore it is obvious that such strengthening members in the support cable 11, along with the signal leads, should preferably be sheathed for environmental protection. Accordingly claims 4 and 5 lack an inventive step in the light of US 2,923,916. Following this reasoning, claims 4 and 5 also lack inventive step in the light of US 3,372,368 and claim 4 lacks inventive step in view of US 4,398,276.

31. The advantage of providing strengthening members in signal cables is well appreciated in the art. Accordingly claim 10 lacks an inventive step in the light of US 2,923,916, US 3,372,368, US 4,398,276 and US 4,884,249.

32. Figures 2 and 3 of US 2,923,916 clearly show that there are a plurality of sensor modules 13,14 and 15 electrically connected to the signal cable 20. Clearly these sensors would transmit data over this signal cable. The document does not disclose that the signal cable 20 provides power to the seismic sensors, but the skilled man would understand that



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Application No : GB0223842.6

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[Examination Report contd.]

'active' sensors could be used and provided with power through the signal cable 20. Providing a power supply to seismic sensors through the signal cable, which is the essence of claim 12, is not inventive over US 2,923,916. Following this reasoning, claim 12 also lack inventive step in the light of US 3,372,368, US 4,398,276 and US 4,884,249.

Clarity and Support (Section 14(5)(b) and (c))

33. The word 'is' at the beginning of line 2 in claim 3 appears to be superfluous.

34. In claim 14 'the electronics modules' has no antecedent in claim 1. Perhaps claim 14 should be dependent on claim 13.

35. Claim 17 recites that 'the plurality of points are positioned between adjacent sensor modules'. This might be taken to mean that all the points are between two adjacent sensor modules. It appears from the figures, especially figure 2A, and from the description that there is just one attachment point between each pair of adjacent sensor modules. Some amendment of claim 17 is required to make it clear and to ensure that it is consistent with the described embodiments.

36. The term 'the separations' in claim 18 has no antecedent in claim 16 or claim 1. Claim 18 is therefore unclear.

37. Claim 20 recites that the arms which affix the support cable to the signal cable 'are *at least one of* rigid and semi-rigid arms'. It is not clear how the arms could be *both* rigid and semi-rigid. If you mean that the arms are *either* rigid *or* semi-rigid, as described at page 14 line 4, then you should say so more clearly. A similar comment applies to claim 34.

Registered Trade Marks

38. Although it should preferably be avoided, if you wish to keep the reference to the Registered Trade Mark "Velcro" on page 12 of your specification, you should acknowledge that it is a Registered Trade Mark, possibly by using the abbreviation "(RTM)". If you do not insert an acknowledgment, I will do so in manuscript.

Other matters

39. The references to 'spirit' of the invention at page 6 line 10 and page 17 line 2 should be deleted.



Your ref : AMS.P52316GB
Application No : GB0223842.6

Date of report: 10 June 2005
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[Examination Report contd.]

Conflict with a corresponding PC'T patent application

40. This application appears to be similar to your international patent application published under number WO2004036252, having the same priority date and designating GB (European Patent). If patents granted on these two applications relate to the same invention, the Comptroller will in due course revoke the patent granted on the present application unless either you amend the present specification to remove the conflict or, before the date of grant of the present application under Section 25(1), you begin proceedings to surrender the European patent(UK). Of course if the GB designation is withdrawn before the grant of the European patent, no action will be required under Section 73(2).

Feb. 2, 1960

J. H. WOODWORTH

2,923,916

MARINE SEISMIC TRANSDUCER SYSTEM

Filed April 1, 1967

2 Sheets-Sheet 1

FIG. 1.



FIG. 2.

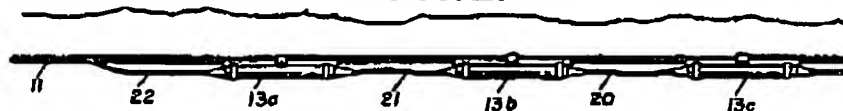


FIG. 4.

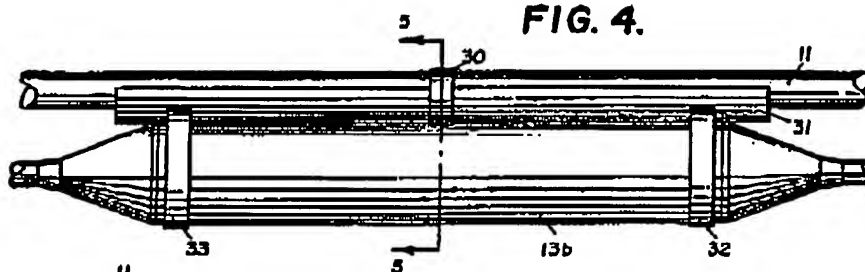


FIG. 3.

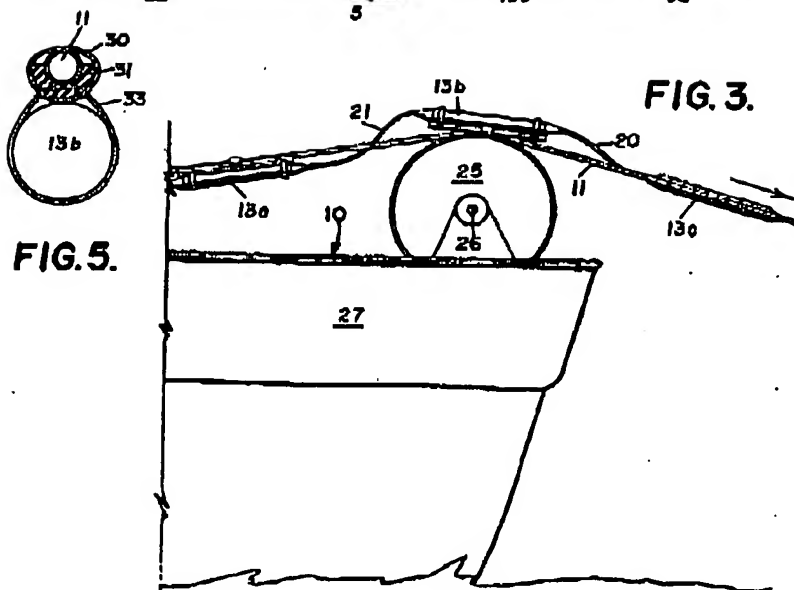
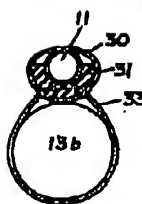


FIG. 5.



United States Patent [19] Snook

[11] Patent Number: 4,884,249
[45] Date of Patent: Nov. 28, 1989

[54] MARINE STREAMER FOR USE IN SEISMIC SURVEYS

[75] Inventor: Clive T. Snook, Oegstgeest, Netherlands

[73] Assignee: GECO A.S., Sandvika, Norway

[21] Appl. No.: 220,675

[22] Filed: Jul. 18, 1988

[30] Foreign Application Priority Data

Jul. 27, 1987 [NO] Norway 873149

[51] Int. Cl.⁴ G01J 1/00

[52] U.S. Cl. 367/154; 367/16; 114/253

[58] Field of Search 181/110-112; 367/15-20, 106, 130, 144, 153, 154; 114/242-243, 249, 251, 253

[56] References Cited

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3,424,267 1/1969 Babb 367/20
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150016 4/1984 Norway .
410126 9/1979 Sweden .

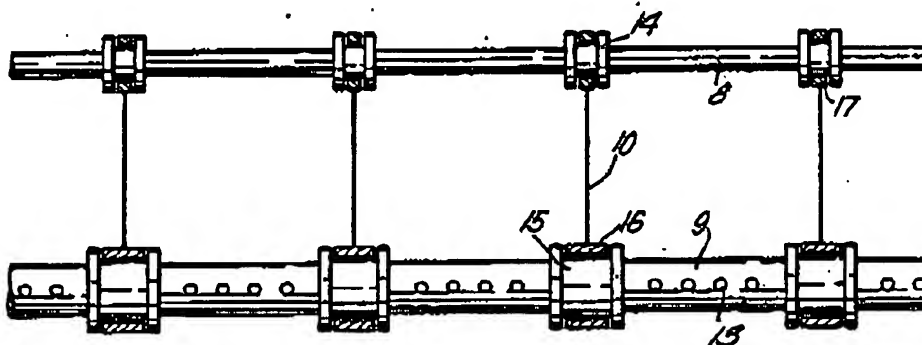
Primary Examiner—Brian S. Steinberger
Attorney, Agent, or Firm—Flett, Jacobson, Cohn, Price, Holman & Stern

[57]

ABSTRACT

In order to avoid noise and error-sources a marine streamer (3) for use in seismic exploration is provided with a buoyancy member (8) which is snake-shaped or tubular-shaped and slightly flexible and supports the active member (9) of the streamer by the aid of narrow suspension ropes (10). The streamer may be made adjustable as regards its height and it may be dividable into sections.

10 Claims, 2 Drawing Sheets

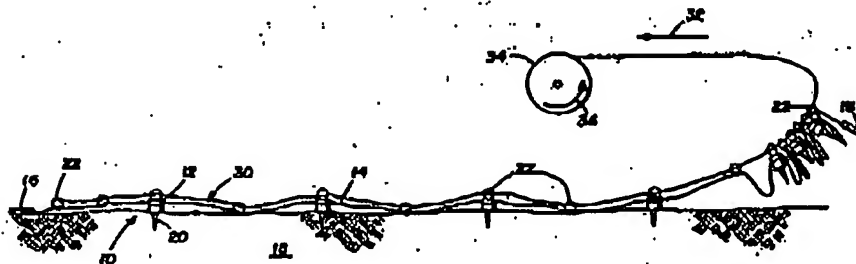


United States Patent [19]**Kruppenbach**[11] **4,398,276**[45] **Aug. 9, 1983**[54] **APPARATUS AND METHOD FOR
GEOPHONE SENSOR STRING PLACEMENT**[75] **Inventor:** John A. Kruppenbach, Lancaster,
Tex.[73] **Assignee:** Energy Analysts Incorporated,
Dallas, Tex.[21] **Appl. No.:** 190,640[22] **Filed:** Sep. 24, 1980[51] **Int. Cl.³** G01V 1/18[52] **U.S. Cl.** 367/191; 405/154;
367/177[58] **Field of Search** 367/14, 15, 20, 177,
367/16, 178; 181/110, 111; 405/134, 157[56] **References Cited****U.S. PATENT DOCUMENTS**

3,930,219 12/1975 Kostelnick 367/177

Primary Examiner—Maynard R. Wilbur**Assistant Examiner**—Marian R. Gordon
Attorney, Agent, or Firm—Richards, Harris & Medlock[57] **ABSTRACT**

A method and apparatus for gathering a geophone sensor string (10) is provided. The geophone sensor string (10) comprises individual sensors (12) for sensing motion of the earth, an interconnecting cable (14) and ring members (22). A line (30) is secured to a ring member (22) at one end of the geophone sensor string. The line is passed through the remaining ring members on the geophone sensor string and extends through the ring member adjacent the opposite end of the geophone sensor string. Drawing the line (30) in the direction of the arrow (32) lifts the sensors off the ground and gathers the sensors and interconnecting cable in an untangled and compact form for storage. The technique of the present invention is adapted for use with vehicles to eliminate manual labor.

5 Claims, 2 Drawing Figures

March 5, 1968

J. R. DALE ET AL

3,372,368

VERTICAL STABILIZATION OF LINE HYDROPHONE ARRAYS

Filed May 31, 1956

Fig. 1

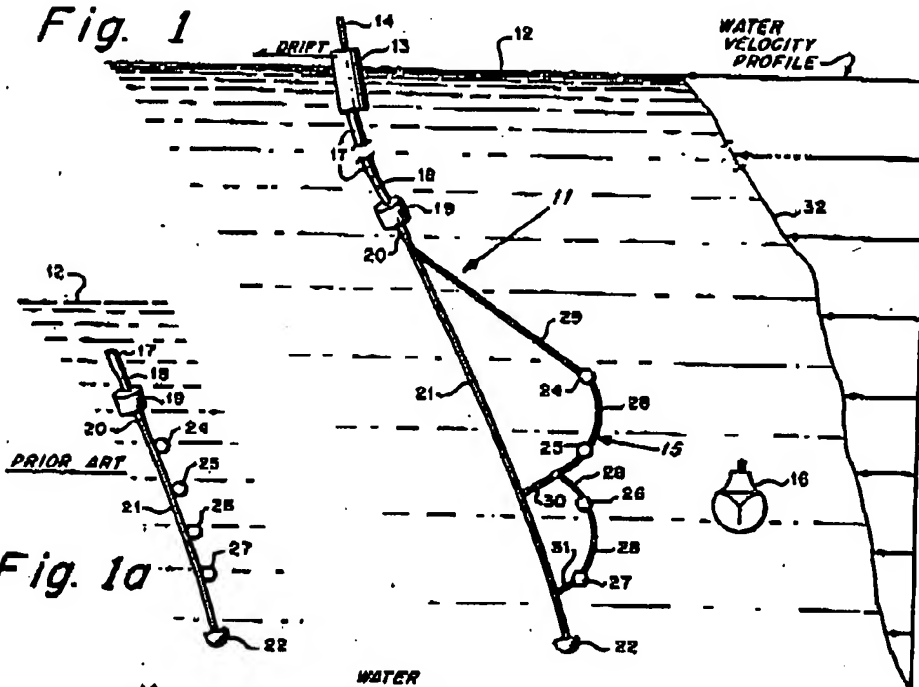


Fig. 1a

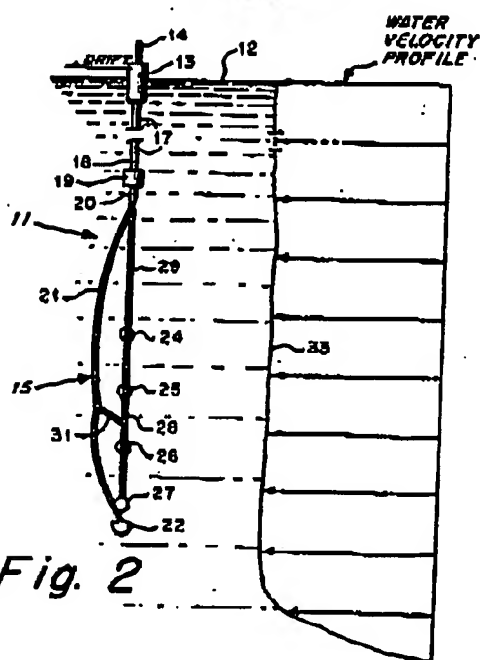


Fig. 2

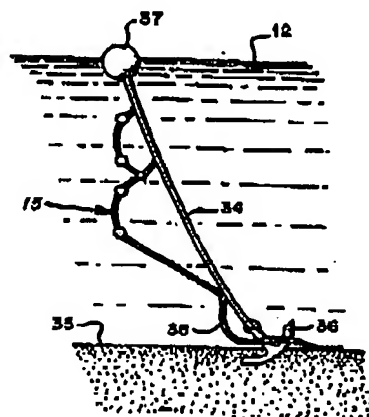


Fig. 3

INVENTORS

JOHN R. DALE
HARRY R. MENZEL

BY

ATTORNEY

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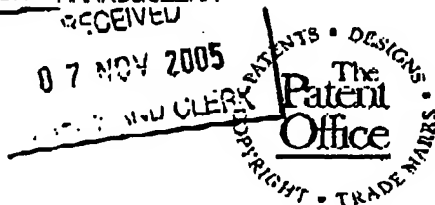
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<http://www.patent.gov.uk>

Your Reference: AMS.P52316GB
Application No: GB0223842.6

1 November 2005

Dear Sirs

Patents Act 1977: Examination Report under Section 18(3)

Latest date for reply:

3 January 2006

I have re-examined your application in response to your agent's letter of 21 October 2005 and enclose two copies of my further examination report.

By the above date you should either file amendments to meet the objections in the enclosed report or make observations on them. If you do not, the application may be refused.

Yours faithfully

Stephen Jennings
Examiner

11-NOV-2005 20:11 FROM: PARKS&CLERK

TO: LINDA LUU

P.04/05



Your ref : AMS.P52316GB
Application No: GB0223842.6
Applicant : WesternGeco Seismic Holdings
Limited

Examiner : Stephen Jennings
Tel : 01633 814986
Date of report : 1 November 2005

Latest date for reply: 3 January 2006

Page 1/2

Patents Act 1977 Examination Report under Section 18(3)

Basis of the examination

1. My examination has taken account of the amendments filed with your agent's letter of 21 October 2005.

Clarity, Support and Novelty (Sections 14(5)(b) & (c) and 1(1)(a))

2. It appears from the comments in the third paragraph of your letter, especially from the reference to figures 2A and 6, that you intend the 'second point' to be defined as a point at which the signal cable is not attached to the support cable. Claims 1 and 29 essentially require that the signal cable is attached to the support cable at a first plurality of points and that the sensor module is disposed on the signal cable at a point which is not one of the first plurality of points. Since the claims do not require that the first plurality of points includes all the points at which the signal cable and support cable are attached, the possibility of the point of attachment of the sensor module being a further point at which the support cable and signal cable are attached is not precluded.

3. In light of the above comments, I remain of the opinion that independent claims 1 and 29 lack novelty over some of the document cited on my earlier examination report. I consider that US 4,398,276, US 4,884,249 and US 5,265,066 each show a support cable attached to a signal cable at three or more points. If one considers just two of the points to be a 'first plurality' of points, there is clearly a 'second point' which is different to the any of the points in the 'first plurality' at which a sensor module is attached. I have considered your observations on these documents, but I am not persuaded by your arguments. In the case of US 4,398,276 I remain of the opinion that the signal cable 14 is attached to a support cable 30. It is true that the two cables are connected via ring members 22 and that as a result the points of attachment are not fixed, but I nevertheless consider that the cables are attached together at a plurality of points. In the case of US 4,884,249 I agree that the floating member 8 provides an entirely different function to the support member described in your application, but I nevertheless consider it to be a support cable which meets the terms of the claims. Claims 1 and 29 do not require that the support cable takes the tension that would be applied to the cable during deployment and/or retrieval so as to protect other elements of the cable. In the case of US 5,265,066 I remain of the opinion that the pulling cable and data cable are attached at a plurality of points even if the geophone spheres are, to a substantial degree, mechanically isolated from one another. I consider US 5,265,066 to be quite similar in nature to the embodiment of your invention shown in figure 7A.

11-NOV-2005 20:12 FROM MARKS&CLERK

TO LINDA LOU

P.05/05



Your ref : AMS.P52316GB
Application No : GB0223842.6

Date of report: 1 November 2005
Page 2 / 2

[Examination Report contd.]

4. It appears that the above novelty objections would be rendered irrelevant if claims 1 and 29 were amended in such a way as to address the lack of clarity outlined in paragraph 2 above.

5. I have restricted my comments in this examination report to the independent claims. You should continue to bear in mind the novelty and inventive step objections made against the dependent claims in my previous examination report.

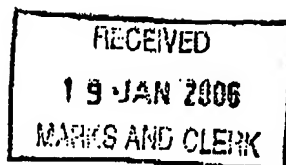
6. You should, on amendment, ensure that there are no described embodiments which fall outside the scope of your claims, so that doubt is not cast on the true scope of the invention. I note that figure 7A shows an arrangement in which each point of attachment of the support cable and signal cable is also a point of attachment of a sensor module.

[Redacted]

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<http://www.patent.gov.uk>

Your Ref: AMS.P52316GB
Application No: GB0223842.6

Patents Act 1977: Report of telephone conversation between Andrew Suckling and Examiner Stephen Jennings held 13 January 2006.

Latest date for reply:

16 February 2006

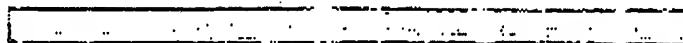
We discussed a clarity issue relating to claim 1, and the corresponding method claim 31. I explained that I felt claim 1 to be unclear inasmuch as a straightforward reading of the claim suggests that the 'second point' is a point at which the support cable and signal cable are not attached. Giving the claim such a meaning suggests that the embodiment illustrated in figure 7A falls outside the scope of the claims. On the other hand, giving the claim a meaning which encompasses figure 7A seems to be a little perverse. We discussed the possibility of removing the reference to the 'second point' from claim 1, and noted that there was no such reference in the original claim. I indicated that there would therefore be no objection to this provided that the amended claim was novel and inventive over the cited prior art and that it appeared that this would indeed be the case in view of the recently introduced limitation of the claims in respect of the purpose of the support cable.

Andrew Suckling agreed to consider this issue and discuss it with the applicant. We agreed a period of one month for response.

Further to an earlier telephone conversation with Andrew Suckling, I confirm that I have considered claims 1-9 and 29-39 as filed on 3 January along with the existing claims 10-28.


Stephen Jennings
(Examiner)

If you feel that this report is inaccurate, please let me know.



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<http://www.patent.gov.uk>

Your Reference: AMS.P52316GB

14 February 2006

Dear Sir/Madam

PATENTS ACT 1977: PATENTS RULES NOTIFICATION OF GRANT: PATENT

L NUMBER:GB2394047

1. I am pleased to tell you that your patent application meets the requirements of the Act and Rules, and that you are now entitled to a patent (for the purposes of Sections 1-23 of the Act) as from the date of grant.

1 number GB0223842.6 complies with the requirements of the Act and Rules, and that you are now entitled to a patent (for the purposes of Sections 1-23 of the Act) as from the date of grant.

2. Grant of the patent is expected to be announced in the Patents and Designs Journal on 15 March 2006. In accordance with section 25(1) of the Act as having been granted and as taking effect from that date. The patent specification will be published on the same date, and you will receive a copy of the specification shortly afterwards.

in the Patents and Designs Journal on 15 March 2006. In accordance with section 25(1) of the Act as having been granted and as taking effect from that date. The patent specification will be published on the same date, and you will receive a copy of the specification shortly afterwards.

3. **IMPORTANT** - It is essential that you take annual renewal payments:

of the following information about annual renewal payments:

- (i) To keep your patent in force, you must pay the Patent Office an annual renewal fee accompanied by Patents Form 100 (which can be obtained from this office).
- (ii) For most patents, the date on which the first renewal fee is due is determined by the first anniversary of the date of filing, and the last anniversary falls is the date on which the first anniversary falls will be due, each year, on the same due date. If you wish, you may pay a renewal fee in the 3-month period before each due date.

st pay the Patent Office an annual renewal fee accompanied by Patents Form 100 (which can be obtained from this office).

he first renewal fee is due is determined by the first anniversary of the date of filing, and the last anniversary falls is the date on which the first anniversary falls will be due, each year, on the same due date. If you wish, you may pay a renewal fee in the 3-month period before each due date.

[PLEASE TURN OVER]

(iii) In some cases, though, there is a first renewal fee on a patent. If you will be given further information referred to in paragraph 2.

(iv) If any renewal fee is not paid by the due date in which to pay the fee. No additional fee is payable if payment is received by the due date, but payment received after the due date is subject to an additional fee, currently £24 per month or

(v) An example:

For a patent filed on 17 October 2006, the first renewal fee is payable on 31 October 2006. Subsequent renewal fees are payable every 12 months. The first free month of the late payment period begins on 1 November 2006 and if no payment was received

special arrangements for the payment of the renewal fee apply to your patent, when you receive the Certificate of Grant

the due date, a further six months is allowed for payment of the renewal fee. If payment is received after the due date, but payment received after the due date is subject to an additional fee of £24 per month overdue.

the first renewal fee would be due for payment on 31 October 2006. It could be paid in advance from 1 August 2006. Subsequent renewal fees are payable every 12 months. The first free month of the late payment period begins on 1 November 2006 and if no payment was received by 30 November 2006, the patent would cease.

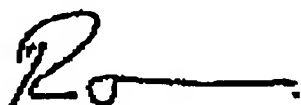
4. If you would like further information about renewals, please send us a blank Patents Form 12/77, please tel

renewal fees, or if you would like us to contact your Renewals Section on 01633-814655.

5. Copies of the specification of the granted patent will be sent to you by the Patent Office, Cardiff Road, Newport, South Wales NP23 5BA. Copies will also be sent to you for a limited period at the London Patent Office, 100 Abchurch Lane, London EC4N 3DF. The copies supplied will be marked to distinguish the specification of the granted patent from that of the published application.

be placed on sale at the Sales Branch, The Patent Office, 100 Abchurch Lane, London EC4N 3DF, as from the date in paragraph 2 above, the suffix "B" after the serial number from that of the published application.

Yours faithfully



RON MARCHANT
COMPTROLLER GENERAL OF PATENTS,
DESIGNS AND TRADE MARKS



Certificate of Grant of Patent

Patent Number: GB2394047
Proprietor(s): WesternGeco Seismic Holdings Limited
Inventor(s): Nicholas Goujon
Johan P Naes
Rune Voldsbekk

This is to Certify that, in accordance with the Patents Act 1977,

a Patent has been granted to the proprietor(s) for an invention entitled
"Multi-part seismic cable" disclosed in an application filed 12 October
2002.

Dated 15 March 2006



Ron Marchant
Comptroller General of Patents,
Designs and Trade Marks
UNITED KINGDOM PATENT OFFICE

The attention of the proprietor(s) is drawn to the important notes overleaf.



(12) **UK Patent** (19) **GB** (11) **2 394 047** (13) **B**

(45) Date of publication: **15.03.2006**

(54) Title of the invention: **Multi-part seismic cable**

(51) INT CL: **G01V 1/20 (2006.01) G01V 1/13 (2006.01)**

(21) Application No: **0223842,6**

(22) Date of Filing: **12.10.2002**

(43) Date A Publication: **14.04.2004**

(52) UK CL (Edition X):
G1G GMC

(58) Documents Cited:

SU 001718174 A	US 5265066 A
US 4884249 A	US 4398278 A
US 3372368 A	US 2923916 A

(58) Field of Search:

As for published application 2394047 A viz:
UK CL (Edition V) G1G
INT CL⁷ G01V
Other: Online WPI, EPODOC, JAP10
updated as appropriate

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Rune Voldsbekk

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